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## EEG KIT

### CLAIM OF PRIORITY

1. This application is a continuation-in-part, under 35 U.S.C. §111(a) of International Application No. PCT/US2010/001264, which was filed on Apr. 29, 2010 and which published as WO 2010/129026 on Nov. 11, 2010, and which claimed the benefit of priority under 35 U.S.C. §119(e) to U.S. Provisional Patent Application No. 61/214,880, entitled “EEG KIT,” which was filed on Apr. 29, 2009, each of which is incorporated herein by reference in its entirety, and the benefit of priority of each of which is hereby presently claimed in this present patent application.

2. This application also claims priority under 35 U.S.C. §119(e) to U.S. Provisional Patent Application Ser. No. 61/448,430, which was filed on Mar. 2, 2011, which application is hereby incorporated by reference herein in its entirety.

### CROSS-REFERENCE TO RELATED PATENT DOCUMENTS

This patent application is related to James G. Donnett et al. U.S. patent application Ser. No. 11/694,816, entitled BRAIN SIGNAL TELEMETRY AND SEIZURE PREDICTION, filed on Mar. 30, 2007, which is hereby incorporated herein by reference in its entirety.

This patent application is related to James G. Donnett et al. U.S. patent application Ser. No. 11/694,855, entitled SEIZURE PREDICTION USING BRAIN SIGNAL TELEMETRY, filed on Mar. 30, 2007, which is hereby incorporated herein by reference in its entirety.

### STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

This invention was made with government support under awards numbered U44 NS057951-01 and RC3NS070658-01 from the National Institute of Neurological Disorders and Stroke. The government has certain rights in this invention.

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### TECHNICAL FIELD

This document pertains generally to medical diagnostic devices and methods, and more particularly, but not by way of limitation, to an electroencephalographic (EEG) kit and user interfaces and methods for use in conjunction therewith.

### BACKGROUND

Electroencephalography (EEG) refers to recording of the electrical activity of the brain over time. Such electrical activity can be produced by bioelectric events within the brain. EEG information can be used to diagnose brain status, such as

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epilepsy, however, obtaining it can involve cumbersome attachment of over twenty tethered electrodes by a trained technician.

### OVERVIEW

This document describes an EEG kit, which can be thought of as “EEG In a Bag” (“EEG-IAB”). The EEG kit can provide a complete, disposable, fast, and easy to use platform to record EEG to measure brain activity. The recorded EEG information can be uplinked to a local or remote user interface. A local or remote neurologist can use the EEG information to render a diagnosis in tens of minutes, wherein such information can currently be unavailable, or can require a number of hours to obtain and diagnose. The EEG kit can be very convenient. In certain examples, the EEG kit can be used in a hospital emergency department (ED), an intensive care unit (ICU), by a first responder, at home, in a battlefield, or can be deployed for emergency or disaster preparedness.

In an emergency department, for example, it is estimated that 14 million (or about 10%) of all emergency department visits annually in the U.S. involve altered mental status (AMS). When a patient with altered mental status arrives at the emergency department, one immediate concern is to determine whether the patient is currently exhibiting seizure activity, or exhibiting symmetry of electrical brain activity which can indicate brain dysfunction, for example following a traumatic injury. One in ten children visiting the emergency department have febrile seizures, which are non-convulsive, and thus not apparent. One in 500 children visiting the emergency department will develop severe epilepsy. In such cases, undiagnosed seizures can cause brain damage, leading to further seizures. The EEG-IAB kit described herein can conveniently be used to quickly confirm or eliminate the presence of seizure activity, so that treatment can be quickly adjusted accordingly.

Currently, EEG recording in the emergency department can be difficult. As a result, it is an under-used diagnostic tool in the emergency department setting. Few emergency departments are equipped with EEG recording devices and have a knowledgeable technician available to hook up and operate such EEG recording devices. Even when an EEG recording device is available, attaching head electrodes for EEG recording can be a 30 minute to 45 minute procedure. Moreover, the tethered bundle of wiring leading from the head electrodes to the EEG recording device can effectively act as an antenna—picking up electrical noise, such as from other nearby equipment, which can interfere with the EEG recording interpretations. Furthermore, the tethered bundle of wiring can also constrain much needed flexibility and often desirable patient mobility. This can be a problem in the dynamic environment of the emergency department (ED), in which saving time can be crucial to patient outcome and, at the very least, can impact cost of the services rendered. EEG recording solutions designed for an epilepsy monitoring unit (EMU) can be particularly vulnerable to the much higher levels of 60 Hz and other ambient noise present in the emergency department. The EMU can shield or isolate the EEG recording from other AC-powered electrical equipment. The emergency department cannot. Thus, an EEG recording solution designed for the EMU can be impaired or ineffective in the ED.

The EEG-IAB kit described herein can address some or all of the above concerns, and can help increase the quality and timeliness of care, and can significantly lower the cost. The EEG-IAB kit described herein can help curb health care costs, such as by helping provide low cost diagnostics and increased outpatient care. The EEG-IAB kit described herein can help